Lockheed Martin Environmental Services
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
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LOCKHEED MARTIN

ORIGINAL (Red)

DATE: May 15, 2002

SUBJECT: Inorganic Data Validation (IM2 Level)
Site: USA Radford Ammunition Pit
Case: 30388 SDGs: MC0QJ6, MC0QL6, and MC0QN5

FROM: (b) (4) [redacted]

[redacted]
Senior Oversight Chemist

TO: Fredrick Foreman
ESAT Region 3 Project Officer

OVERVIEW

Case 30388, Sample Delivery Groups (SDGs) MC0QJ6, MC0QL6 and MC0QN5 contained thirty nine (39) soil samples and one (1) associated aqueous Quality Control (QC) sample analyzed for total metals by Liberty Analytical Corporation (LIBRTY). The sample set included one (1) field blank and three (3) field duplicate pairs. Samples were analyzed according to Contract Laboratory Program (CLP) Statement of Work (SOW) ILM04.1 through Routine Analytical Services (RAS) program.

SUMMARY

All samples were successfully analyzed for all Inorganic Target Analyte List (TAL) metals except antimony (Sb). Areas of concern with respect to data usability are listed below.

Data for this case have been impacted by outliers generated in laboratory blanks as well as matrix spike, ICP serial dilution, laboratory duplicate analysis and Contract Required Detection Limit (CRDL) standards analyses. Details regarding these outliers are discussed under "Major and Minor Problems". Specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on Data Summary Forms (DSFs).

MAJOR PROBLEM

Matrix spike recovery was extremely low for Sb (16.8% and 15.6% in SDGs MC0QJ6 and MC0QL6, respectively). No positive results were reported for Sb in either SDG. Quantitation limits for Sb in samples in SDGs MC0QJ6 and MC0QL6 were rejected and qualified "R" on the DSFs.

MINOR PROBLEMS

Continuing Calibration (CCB) and Preparation (PB) Blanks had reported results greater than Instrument Detection Limits (IDLs) for the analytes listed below. Reported results in affected samples which are less than or equal to five times (≤5X) blank concentrations may be biased high and have been qualified "B" on DSFs.

ORIGINAL (Red)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MD 20755-5350

DATE : June 3, 2002

SUBJECT: Region III Data QA Review

FROM : Fredrick Foreman
Region III ESAT RPO (3ES20)

TO : James McKenzie
Regional Project Manager (3HS42)

Attached is the inorganic data validation report for the USA Radford Ammunition Pit site (Case #: 30388, SDG#: MC0QJ6, MC0QL6, MC0QN5) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have any questions regarding this review, please call me at (410) 305-2629.

Attachments

cc: (b) (4) [redacted]

TO File: 0007 TDF#: 0507

SDG	Blank	Affected Analytes
MC0QJ6	CCB	arsenic (As), beryllium (Be), calcium (Ca),
MC0QN5	CCB	cobalt (Co)
	PB	mercury (Hg), zinc (Zn)

Continuing calibration and/or preparations blank had negative values greater than absolute values of IDLs for selenium (Se) and thallium (Tl) in SDG MC0QN5. No positive results associated with these blanks were reported. Quantitation limits were qualified "UL" on DSFs.

CRDL standard recoveries were low (<90%) for analytes Se in SDG MC0QL6 and lead (Pb) in SDG MC0QN5. Low recoveries may indicate negative biases for results detected near detection limits due to an unstable baseline. Reported results relative to these analytes in affected samples which are less than 2XCRDL may be biased low and have been qualified "L" on the DSFs. Quantitation limits for these analytes in affected samples may be biased low and have been qualified "UL" on DSFs.

CRDL standard recovery was high (>130%) for Hg in SDG MC0QN5. High recovery may indicate a positive bias for results detected near detection limits due to an unstable baseline. The "K" qualifier for Hg result in sample MC0QN5 was superseded by "B"on the DSF.

Percent Differences (%Ds) for ICP serial dilution analyses were outside control limits (>10%) for Zn in SDG MC0QJ6 and for magnesium (Mg) and nickel (Ni) in SDG MC0QL6. Positive results regarding these analytes are estimated and have been qualified "J" on DSFs.

Matrix spike recoveries were low (<75%) for Se and Tl in SDG MC0QL6. Reported results for these analytes may be biased low and were qualified "L" on DSF. Quantitation limits were qualified "UL".

The Relative Percent Difference (RPD) for the laboratory duplicate analysis was outside control limits (35% RPD, ±2XCRDL) for manganese (Mn) in SDG MC0QL6. Positive results for Mn are estimated and have been qualified "J" on DSFs.

NOTES

The sample identified as a field blank, MC0QN5, reported high concentrations of Ca, Mg and iron (Fe) and lesser concentrations of thirteen (13) other metals. These results suggest the water was either a background water sample or a severely contaminated field blank. No data were qualified for blank contamination in any sample associated with this case based on this sample.

All data for Case 30388, SDGs MC0QJ6, MC0QL6 and MC0QN5, were reviewed in accordance with Region 3 Modifications to the Inorganic National Functional Guidelines, April 1993.

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers added to the laboratory results during data validation process.

ATTACHMENTS

TABLE 1A	Summary of Qualifiers on DSF after Data Validation
TABLE 1B	Codes Used In Table 1A Comments Column
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Forms
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narratives

DCN: 30388inorg_rpt

ORIGINAL (Red)

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY FORM AFTER DATA VALIDATION

CASE: 30388
SDG#: MC0QJ6

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
As	MC0QK2	B		High	CCB (2.1 ug/L)
Be	MC0QK2, MC0QK8, MC0QK9, MC0QL0, MC0QL4	B		High	CCB (0.3 ug/L)
Ca	MC0QJ8	B		High	CCB (41.4 ug/L)
	MC0QK1, MC0QK3, MC0QK4, MC0QL0	B		High	CCB (88.4 ug/L)
Sb	All Samples		R	Extremely Low	MSE (16.8%)
Zn	All Samples	J			ISD (10.7%)

SDG#: MC0QL6

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Mg	All Samples	J			ISD (10.2%)
Mn	All Samples	J			DUP (44.2%)
Ni	All Samples	J			ISD (12.1%)
Sb	All Samples		R	Extremely Low	MSE (15.6%)
Se	All Samples	L	UL	Low	MSL (48.6%) CRL (88.0%, 88.0%)
Tl	All Samples		UL	Low	MSL (68.8%)

* see explanation of comments on Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY FORM AFTER DATA VALIDATION

CASE: 30388
SDG#: MC0QN5

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON-DETECTED VALUES	BIAS	COMMENTS*
Co	MC0QN5	B		High	CCB (0.9 ug/L)
Pb	MC0QN5		UL	Low	CRL (84%)
Hg	MC0QN5	B		High	PB (0.124 ug/L) CRH (150%)
Se	MC0QN5		UL	Low	PBN (-2.251 ug/L)
Tl	MC0QN5		UL	Low	CBN (-2.5 ug/L)
Zn	MC0QN5	B		High	PB (3.041 ug/L)

* see explanation of comments on Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB = Continuing calibration blanks had results > IDL (the result is in parenthesis). Reported results which are less than five times (<5X) blank concentrations may be biased high.

MSE = The matrix spike recovery was extremely low (<30%) [% recovery is in parenthesis]. Quantitation limits are unuseable.

ISD = Percent difference (%D) for the ICP serial dilution analysis exceeded the control limit (10%) [% recovery is in parenthesis]. Reported results are estimated.

DUP = Laboratory duplicate analyses were outside control limits (35% RPD, ±2XCRDL) [RPD is in parenthesis]. Reported results are estimated.

MSL = The matrix spike recovery was low (<75%) [% recovery is in parenthesis]. Positive results and quantitation limits may be biased low.

CRL = CRDL standard recoveries were low (<90%) [% recovery is in parenthesis]. Reported results which are <2XCRDL and quantitation limits may be biased low.

PB = Preparation blanks had results > IDL (result is in parenthesis). Reported results which are less than five times (<5X) blank concentrations may be biased high.

CRH = CRDL standard recoveries were high (>130% for Hg) [% recovery is in parenthesis]. Reported results which are <2XCRDL may be biased high.

PBN = Preparation blanks had negative results with absolute values greater than IDLs (result is in parenthesis). Quantitation limits may be biased low.

CBN = Continuing calibration blanks had negative results with absolute values greater than IDLs (result is in parenthesis). Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

ORIGINAL (Red)

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

ORIGINAL (Red)

Case #: 30388 SDG : MC0QJ6 Number of Soil Samples : 20
Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0
Lab. : LIBRTY

Sample Number :		MC0QJ6		MC0QJ7		MC0QJ8		MC0QJ9		MC0QK0	
Sampling Location :		SS-01		SB-01A		SB-01B		SS-02		SB-02A	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		09:10		09:10		09:10		09:30		09:30	
%Solids :		61.0		69.5		67.6		71.8		68.6	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	24000		29900		29600		13300		23900	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	11.9		22.4		33.0		6.1		8.9	
BARIUM	40	[61.3]		[17.9]		[19.7]		[44.9]		[51.2]	
BERYLLIUM	1	[0.89]		2.0		[1.3]		[0.49]		[0.83]	
CADMIUM	1	[0.58]		[0.72]		[0.72]		[0.25]		[0.47]	
CALCIUM	1000	7150		[312]		[28.0]	B	4580		5160	
CHROMIUM	2	27.8		35.9		48.7		19.1		28.6	
COBALT	10	[8.1]		[4.4]		[7.3]		[4.5]		[7.2]	
COPPER	5	49.0		55.7		70.0		26.3		42.8	
IRON	20	39500		62800		66900		22200		37900	
*LEAD	0.6	34.3		25.9		39.5		18.3		26.9	
MAGNESIUM	1000	[1450]		[633]		[747]		[1010]		[1280]	
MANGANESE	3	559		116		139		388		450	
MERCURY	0.1	[0.090]		0.18		[0.11]		[0.080]		0.17	
NICKEL	8	19.9		28.1		31.1		[10.0]		17.6	
POTASSIUM	1000	1760		[678]		[1060]		[1160]		1500	
SELENIUM	1	[1.3]		[1.4]		[1.2]		[1.0]		[1.3]	
SILVER	2										
SODIUM	1000	[175]		[73.9]				[128]		[157]	
THALLIUM	2										
VANADIUM	10	61.9		100		100		39.0		66.4	
ZINC	4	110	J	41.7	J	31.1	J	53.9	J	89.8	J

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

ORIGINAL (Red)

Case #: 30388 SDG : MC0QJ6 Number of Soil Samples : 20

Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0

Lab. : LIBRTY

Sample Number :		MC0QK1		MC0QK2		MC0QK3		MC0QK4		MC0QK5	
Sampling Location :		SB-02B		SS-03		SB-03A		SB-03B		SS-04	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		09:30		10:00		10:00		10:00		10:20	
%Solids :		72.2		40.4		70.2		76.5		44.9	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	33500		10400		40600		21400		15400	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	12.4		[4.8]	B	8.6		8.2		8.2	
BARIUM	40	[29.9]		[55.5]		[29.4]		[22.5]		[67.6]	
BERYLLIUM	1	1.6		[0.50]	B	[1.0]		3.5		[0.71]	
CADMIUM	1	[0.48]		[0.26]		[0.61]		[0.38]		[0.19]	
CALCIUM	1000	[109]	B	7320		[98.0]	B	[24.7]	B	7270	
CHROMIUM	2	39.4		14.5		38.5		17.5		19.7	
COBALT	10	14.1		[7.4]		[8.2]		37.3		[7.0]	
COPPER	5	60.9		25.5		84.8		56.9		31.2	
IRON	20	49500		18400		53000		36000		28000	
*LEAD	0.6	27.9		15.4		26.9		23.6		17.5	
MAGNESIUM	1000	[1230]		[1580]		[1120]		1990		[1790]	
MANGANESE	3	114		446		81.7		222		469	
MERCURY	0.1	[0.084]		[0.12]		0.19		[0.088]		[0.15]	
NICKEL	8	23.1		[9.7]		29.8		34.4		[13.7]	
POTASSIUM	1000	1530		[1460]		1410		1840		[1710]	
SELENIUM	1	[0.63]		[1.5]		[1.2]		[0.63]		[1.7]	
SILVER	2										
SODIUM	1000			[116]				[39.5]		[89.2]	
THALLIUM	2										
VANADIUM	10	86.6		34.0		94.2		71.3		50.3	
ZINC	4	22.9	J	35.6	J	19.9	J	34.5	J	34.5	J

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

ORIGINAL (Red)

DATA SUMMARY FORM: INORGANIC

Case #: 30388 SDG : MC0QJ6 Number of Soil Samples : 20
Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0
Lab. : LIBRTY

Sample Number :		MC0QK6		MC0QK7		MC0QK8		MC0QK9		MC0QL0	
Sampling Location :		SB-04A		SB-04B		SS-05		SB-05A		SB-05B	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		10:20		10:20		11:00		11:00		11:00	
%Solids :		74.1		73.9		57.6		84.7		82.8	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	34100		23300		8720		9680		7680	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	12.7		20.0		5.0		11.1		7.3	
BARIUM	40	[31.8]		[21.9]		[62.2]		[16.5]		[13.1]	
BERYLLIUM	1	[1.2]		5.8		[0.40]	B	[0.26]	B	[0.25]	B
CADMIUM	1	[0.64]		[0.43]		[0.22]		[0.18]		[0.096]	
CALCIUM	1000	[754]		[458]		3520		[172]		[88.3]	B
CHROMIUM	2	36.2		30.8		14.5		28.5		25.6	
COBALT	10	[6.4]		145		[6.6]		[1.9]		[2.0]	
COPPER	5	49.4		47.3		17.5		16.1		13.8	
IRON	20	56100		58300		15000		26700		22100	
*LEAD	0.6	17.1		68.6		20.9		8.9		9.6	
MAGNESIUM	1000	1520		[914]		[741]		[265]		[204]	
MANGANESE	3	85.6		1230		752		79.3		63.4	
MERCURY	0.1	0.19		0.25		[0.10]				[0.060]	
NICKEL	8	24.5		35.5		[5.0]		[3.2]		[3.0]	
POTASSIUM	1000	1360		[957]		[804]		[422]		[308]	
SELENIUM	1	[1.0]		[0.97]		[1.2]		[0.86]		[1.0]	
SILVER	2										
SODIUM	1000			[56.3]		[103]				[36.6]	
THALLIUM	2										
VANADIUM	10	96.4		88.7		29.5		53.0		43.8	
ZINC	4	24.2	J	34.0	J	41.5	J	8.4	J	7.2	J

CRDL = Contract Required Quantitation Limit SEE NARRATIVE FOR CODE DEFINITIONS
To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100) Revised 09/99

ORIGINAL (Red)

DATA SUMMARY FORM: INORGANIC

Case #: 30388 SDG : MC0QJ6 Number of Soil Samples : 20
Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0
Lab. : LIBRTY

Sample Number :		MC0QL1		MC0QL2		MC0QL3		MC0QL4		MC0QL5	
Sampling Location :		SS-06		SB-06A		SB-06B		SS-07		SB-07A	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		11:45		11:45		11:45		12:15		12:15	
%Solids :		75.9		72.7		68.8		38.7		75.2	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	15200		25600		34300		14200		22100	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	9.1		19.4		14.6		9.4		11.9	
BARIUM	40	[42.3]		[41.3]		[36.5]		[73.8]		[24.2]	
BERYLLIUM	1	[0.50]		[0.73]		[1.2]		[0.51]	B	[0.65]	
CADMIUM	1	[0.25]		[0.43]		[0.52]		[0.39]		[0.19]	
CALCIUM	1000	1760		[1040]		[555]		6370		[556]	
CHROMIUM	2	27.4		39.3		49.6		21.6		30.8	
COBALT	10	[5.1]		[6.6]		[6.8]		[7.4]		[5.7]	
COPPER	5	22.9		41.3		47.0		28.6		34.4	
IRON	20	29200		50500		61200		24900		38900	
*LEAD	0.6	17.5		22.1		29.7		25.1		29.4	
MAGNESIUM	1000	[735]		[787]		[747]		[1290]		[551]	
MANGANESE	3	346		55.2		76.4		697		66.2	
MERCURY	0.1					0.14					
NICKEL	8	[7.2]		18.3		16.5		[11.4]		15.7	
POTASSIUM	1000	[1160]		[954]		[967]		[1660]		[855]	
SELENIUM	1	[0.82]		1.3		[1.2]		[1.5]		[0.58]	
SILVER	2										
SODIUM	1000							[171]			
THALLIUM	2										
VANADIUM	10	57.3		90.5		130		49.1		72.8	
ZINC	4	19.0	J	16.4	J	17.8	J	44.7	J	16.8	J

CRDL = Contract Required Quantitation Limit SEE NARRATIVE FOR CODE DEFINITIONS
To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100) Revised 09/99

ORIGINAL (Red)

DATA SUMMARY FORM: INORGANIC

Case #: 30388 SDG : MC0QL6 Number of Soil Samples : 19
Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0
Lab. : LIBRTY

Sample Number :		MC0QL6		MC0QL7		MC0QL8		MC0QL9		MC0QM0	
Sampling Location :		SB-07B		SS-08		SB-8A		SB-08B		SS-09	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		12:15		13:30		13:30		13:30		14:00	
%Solids :		73.4		50.6		71.3		73.9		53.1	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	18300		14300		25600		23000		6930	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	13.0		13.7		17.8		16.3		6.7	
BARIUM	40	[30.1]		[46.9]		[22.3]		[28.3]		219	
BERYLLIUM	1	[0.59]		[0.88]		[1.3]		2.9		[0.44]	
CADMIUM	1	[0.27]		[0.43]		[0.46]		[0.16]		[1.4]	
CALCIUM	1000	[1130]		7830		[149]		[880]		113000	
CHROMIUM	2	26.9		23.1		34.7		30.4		60.9	
COBALT	10	[6.4]		[8.6]		[5.7]		34.6		[16.8]	
COPPER	5	31.0		31.8		40.4		37.4		123	
IRON	20	34500		32500		51200		42500		15000	
*LEAD	0.6	23.5		36.7		26.0		42.6		62.7	
MAGNESIUM	1000	[597]	J	[990]	J	[648]	J	[918]	J	8550	J
MANGANESE	3	133	J	351	J	62.6	J	173	J	1760	J
MERCURY	0.1			[0.090]		[0.11]		0.20			
NICKEL	8	13.5	J	[14.5]	J	16.4	J	17.7	J	28.5	J
POTASSIUM	1000	[838]		[1500]		[856]		[731]		6840	
SELENIUM	1	1.4	L	[1.5]	L	[1.3]	L		UL	[1.8]	L
SILVER	2										
SODIUM	1000			[269]				[153]		10600	
THALLIUM	2		UL		UL		UL		UL		UL
VANADIUM	10	64.3		50.5		85.4		71.9		22.7	
ZINC	4	20.3		117		16.1		16.2		1920	

CRDL = Contract Required Quantitation Limit SEE NARRATIVE FOR CODE DEFINITIONS
To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100) Revised 09/99

ORIGINAL (Red)

Case #: 30388 SDG : MC0QL6 Number of Soil Samples : 19

Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0

Lab. : LIBRTY

Sample Number :		MC0QM1		MC0QM2		MC0QM3		MC0QM4		MC0QM5	
Sampling Location :		SB-09A		SB-09B		SS-10		SB-10A		SB-10B	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		14:00		14:00		14:20		14:20		14:20	
%Solids :		72.3		71.7		67.4		70.1		76.2	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	29900		30000		18900		26400		31100	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	17.8		14.9		13.0		15.3		17.0	
BARIUM	40	[20.8]		[22.1]		[28.4]		[17.1]		[27.9]	
BERYLLIUM	1	[0.97]		[1.2]		[0.72]		[0.88]		2.2	
CADMIUM	1	[0.62]		[0.48]		[0.38]		[0.66]			
CALCIUM	1000	[326]		[162]		1410		[176]		[89.7]	
CHROMIUM	2	45.3		40.9		24.8		48.8		36.3	
COBALT	10	[3.8]		[12.9]		[6.7]		[2.6]		111	
COPPER	5	41.3		41.7		29.8		40.4		29.3	
IRON	20	56500		54900		38000		57100		55100	
*LEAD	0.6	22.5		38.6		20.1		17.6		157	
MAGNESIUM	1000	[664]	J	[639]	J	[832]	J	[552]	J	[658]	J
MANGANESE	3	65.8	J	93.6	J	153	J	55.2	J	688	J
MERCURY	0.1	0.28				[0.10]		[0.13]			
NICKEL	8	13.1	J	13.9	J	13.8	J	12.6	J	14.7	J
POTASSIUM	1000	[1120]		[953]		1390		[880]		[1210]	
SELENIUM	1	[1.1]	L	[1.1]	L	1.4	L	[1.2]	L		UL
SILVER	2										
SODIUM	1000	[68.1]		[52.5]		[65.3]					
THALLIUM	2		UL		UL		UL		UL		UL
VANADIUM	10	143		168		56.6		120		171	
ZINC	4	17.4		17.1		20.5		15.4		19.6	

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

ORIGINAL (Red)

Case #: 30388 SDG : MC0QL6 Number of Soil Samples : 19

Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0

Lab. : LIBRTY

Sample Number :		MC0QM6		MC0QM7		MC0QM8		MC0QM9		MC0QN0	
Sampling Location :		SS-12		SB-12A		SB-12B		SS-13		SB-13A	
Field QC:								Dupl. of MC0QN2		Dupl. of MC0QN3	
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002		04/16/2002	
Time Sampled :		14:40		14:40		14:40		15:15		15:15	
%Solids :		55.1		73.5		82.3		59.2		77.8	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	9530		16700		7220		13800		11900	
ANTIMONY	12		R		R		R		R		R
ARSENIC	2	7.2		11.1		4.3		11.3		8.6	
BARIUM	40	[58.4]		[26.5]		[3.9]		[46.7]		[23.8]	
BERYLLIUM	1	[0.54]		[0.66]		[0.51]		[0.70]		[0.60]	
CADMIUM	1	[0.29]		[0.37]		[0.13]		[0.53]		[0.29]	
CALCIUM	1000	4810		[835]		[166]		4590		[1180]	
CHROMIUM	2	16.6		28.0		8.2		23.8		15.8	
COBALT	10	[4.8]		[3.7]		[9.2]		[12.5]		[5.1]	
COPPER	5	23.4		27.2		10.3		26.5		20.9	
IRON	20	19900		33800		14600		29300		25100	
*LEAD	0.6	19.7		12.4		7.5		32.6		30.1	
MAGNESIUM	1000	[884]	J	[626]	J	[226]	J	[958]	J	[494]	J
MANGANESE	3	388	J	130	J	109	J	239	J	66.3	J
MERCURY	0.1									[0.053]	
NICKEL	8	[6.8]	J	[8.4]	J	[4.2]	J	[10.5]	J	[7.8]	J
POTASSIUM	1000	[1190]		1290		[351]		[1160]		[747]	
SELENIUM	1	[1.0]	L	[1.1]	L		UL	[0.76]	L	[0.74]	L
SILVER	2										
SODIUM	1000	[95.4]		[65.4]		[46.4]		[157]		[75.2]	
THALLIUM	2		UL		UL		UL		UL		UL
VANADIUM	10	37.8		62.0		20.9		44.0		37.1	
ZINC	4	33.7		19.1		6.4		91.8		30.3	

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

ORIGINAL (Red)

Case #: 30388 SDG : MC0QL6 Number of Soil Samples : 19

Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 0

Lab. : LIBRTY

Sample Number :		MC0QN1		MC0QN2		MC0QN3		MC0QN4			
Sampling Location :		SB-13B		SS14		SB-14A		SB-14B			
Field QC:		Dupl. of MC0QN4		Dupl. of MC0QM9		Dupl. of MC0QN0		Dupl. of MC0QN1			
Matrix :		Soil		Soil		Soil		Soil			
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg			
Date Sampled :		04/16/2002		04/16/2002		04/16/2002		04/16/2002			
Time Sampled :		15:15		15:15		15:15		15:15			
%Solids :		73.9		57.1		78.6		74.3			
Dilution Factor :		1.0		1.0		1.0		1.0			
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	25800		11100		13700		24000			
ANTIMONY	12		R		R		R		R		
ARSENIC	2	13.9		8.6		9.7		13.3			
BARIUM	40	[18.6]		[44.4]		[14.8]		[20.5]			
BERYLLIUM	1	1.3		[0.57]		[0.63]		1.7			
CADMIUM	1	[0.46]		[0.50]		[0.34]		[0.50]			
CALCIUM	1000	[228]		5340		[571]		[221]			
CHROMIUM	2	30.2		20.1		17.2		26.4			
COBALT	10	[6.2]		[8.0]		[4.0]		[12.3]			
COPPER	5	38.4		22.1		22.1		35.8			
IRON	20	44000		22800		28200		38700			
*LEAD	0.6	18.9		29.4		15.2		25.9			
MAGNESIUM	1000	[784]	J	[939]	J	[475]	J	[799]	J		
MANGANESE	3	50.1	J	223	J	47.3	J	148	J		
MERCURY	0.1										
NICKEL	8	15.7	J	[8.6]	J	[8.8]	J	21.4	J		
POTASSIUM	1000	[941]		[1080]		[674]		[1060]			
SELENIUM	1	[1.1]	L	[1.1]	L	[0.70]	L	[0.95]	L		
SILVER	2										
SODIUM	1000	[44.9]		[166]		[56.3]					
THALLIUM	2		UL		UL		UL		UL		
VANADIUM	10	61.2		34.5		40.4		46.5			
ZINC	4	16.9		95.0		16.7		17.9			

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

ORIGINAL (Red)

Case #: 30388 SDG : MC0QN5 Number of Soil Samples : 0

Site : USA RADFORD AMMUNITION PIT Number of Water Samples : 1

Lab. : LIBRTY

Sample Number :		MC0QN5									
Sampling Location :		FB									
Field QC:		Field Blank									
Matrix :		Water									
Units :		ug/L									
Date Sampled :		04/16/2002									
Time Sampled :		16:00									
Dilution Factor :		1.0									
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	238									
ANTIMONY	60	[2.5]									
*ARSENIC	10										
BARIUM	200	[11.6]									
BERYLLIUM	5										
*CADMIUM	5										
CALCIUM	5000	31500									
*CHROMIUM	10	[7.2]									
COBALT	50	[1.1]	B								
COPPER	25	[2.8]									
IRON	100	1520									
*LEAD	3		UL								
MAGNESIUM	5000	6650									
MANGANESE	15	17.1									
MERCURY	0.2	[0.12]	B								
*NICKEL	40	[4.9]									
POTASSIUM	5000	[579]									
SELENIUM	5		UL								
SILVER	10										
SODIUM	5000	[1160]									
THALLIUM	10		UL								
VANADIUM	50	[1.8]									
ZINC	20	[5.8]	B								

CRDL = Contract Required Quantitation Limit *Action Level Exists SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) Revised 09/99

Appendix C

Chain of Custody Records

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. CT1254

1. Project Code	2. Account Code	3. Region No.	Sampling Co.	5. Date Shipped	Carrier
SI	2002T03N5010 20D3XL	3	Techlaw	4/17/02	Fedex

Regional Information: w/o

Sampler (Name): Tolkme

Non-Superfund Program

Sampler Signature:

Airbill Number: 27513-NC-US 7918 1821 6090

6. Ship To: Liberty Analytical, 501 Madison Ave, Cary NC 27513, ATTN: Alice Evans

Site Name: VAR000207730

City, State: Dublin VA

Site Spill ID

4. Purpose*
Lead: SF, PRP, ST, FED
Early Action: CLEM, PA, REM, RI, [X] SI, ESI
Long-Term Action: FS, RD, RA, O&M, NPLD

7. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

8. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 7) Other:	B Conc.: Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 8) Other:	E — RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low Only: NO_2/NO_3	Fluoride	High Only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank S = Spike D = Duplicate R = Rinsate PE = Perform Eval. — = Not a QC Sample)
CT1254															CT1253		
-01	5	L	G	6		X						3062143-145	SS-01	4/16/02 0910	-01	✓	
-02	5	L	G	6		X						-146	SB-01A	0910	-02	✓	
-03	5	L	G	6		X						-147	SB-01B	0910	-03	✓	
-04	5	L	G	6		X						-148	SS-02	0930	-04	✓	
-05	5	L	G	6		X						-149	SB-02A	0930	-05	✓	
-06	5	L	G	6		X						-150	SB-02B	0930	-06	✓	
-07	5	L	G	6		X						-151	SS-03	1000	-07	✓	
-08	5	L	G	6		X						-152	SB-03A	1000	-08	—	
-09	5	L	G	6		X						-153	SB-03B	1000	-09	✓	
-10	5	L	G	6		X						-154	SS-04	1020	-10	✓	

Shipment for Case Complete? (Y/N): N
Page 1 of 5
Sample(s) to be Used for Laboratory QC: CT1254-01
Additional Sampler Signatures
Chain of Custody Seal Number(s)

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/17 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	

ORIGINAL

Distribution: Green - Region Copy; White - Lab Copy for Return to Region; Pink - CLASS Copy; Yellow - Lab Copy for Return to CLASS

EPA Form 9110-1 (8/99)

See Reverse for Additional Standard Instructions
*See Reverse for Purpose Code Definitions

ORIGINAL (Red)

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. CT 1254

1. Project Code	2. Account Code	3. Region No.	Sampling Co.	5. Date Shipped	Carrier
SI	2002T03W501020D3YL	3	Tech Law		Fedex

Regional Information:

Non-Superfund Program:

Sampler (Name): TCLLin

Sampler Signature: [signature]

Airbill Number: See Page 1

6. Ship To: Liberty Analytical
501 Madison Ave
Cary NC 27513
ATTN: Alice Evans

Site Name: VA1210020730

City, State: Diblo VA

Site Spill ID:

4. Purpose*
Lead: SF, PRP, ST, FED
Early Action: CLEM, PA, REM, RI, SI [X], ESI
Long-Term Action: FS, RD, RA, O&M, NPLD

7. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

8. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 7) Other:	B Conc.: Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 8) Other:	E — RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low Only: NO_2/NO_3	Fluoride	High Only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform Eval., — = Not a QC Sample)
CT1254														4/16/02	CT 1253		
-11	5	L	G	6		X						3062155	SB-04A	1020	-11	[initials]	
-12	5	L	G	6		X						156	SB-04B	1020	-12	[initials]	
-13	5	L	G	6		X						157	SS-05	1100	-13	[initials]	
-14	5	L	G	6		X						158	SB-05A	1100	-14	[initials]	
-15	5	L	G	6		X						159	SB-05B	1100	-15	[initials]	
-16	5	L	G	6		X						160	SS-06	1145	-16	[initials]	
-17	5	L	G	6		X						161	SB-06A	1145	-17	[initials]	
-18	5	L	G	6		X						162	SB-06B	1145	-18	[initials]	
-19	5	L	G	6		X						163	SS-07	1215	-19	[initials]	
-20	5	L	G	6		X						164	SB-07A	1215	-20	[initials]	

Shipment for Case Complete? (Y/N)	Page 2 of 5	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/17 / 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	

Distribution: Green - Region Copy; White - Lab Copy for Return to Region; Pink - CLASS Copy; Yellow - Lab Copy for Return to CLASS

EPA Form 9110-1 (8/99)

See Reverse for Additional Standard Instructions
*See Reverse for Purpose Code Definitions

395063

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. CT 1254 30387

1. Project Code: SI	2. Account Code: 2002T03NSUW2003 WAO	3. Region No.: YL 3	Sampling Co.: Tech law	5. Date Shipped	Carrier: Fedex
Regional Information		Sampler (Name): Fellinger		Airbill Number: See Page 1	
Non-Superfund Program		Sampler Signature		6. Ship To: Liberty Analytical, 501 Madison Ave, Cary NC 27513	
Site Name: VAE21002 0730		4. Purpose*: Lead: SF, PRP, ST, FED; Early Action: CLEM, PA, REM, RI, [X] SI, ESI; Long-Term Action: FS, RD, RA, O&M, NPLD		ATTN: Alice Evans	
City, State: Dublin VA	Site Spill ID				

7. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

8. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 7) Other:	B Conc.: Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 8) Other:	E — RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low Only: NO_2NO_3	Fluoride	High Only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier
CT1254														4/16/02	CT1253		
-21	5	L	G	6		X						3062165	SB-07B	1215	-21	~	
-22	5	L	G	6		X						-166	SS-08	1330	-22	~	
-23	5	L	G	6		X						-167	SB-08A	1330	-23	~	
-24	5	L	G	6		X						-168	SB-08B	1330	-24	~	
-25	5	L	G	6		X						-169	SS-09	1400	-25	~	
-26	5	L	G	6		X						-170	SB-09A	1400	-26	~	
-27	5	L	G	6		X						-171	SB-09B	1400	-27	~	
-28	5	L	G	6		X						-172	SS-10	1420	-28	~	
-29	5	L	G	6		X						-173	SB-10A	1420	-29	~	
-30	5	L	G	6		X						-174	SB-10B	1420	-30	~	

B = Blank S = Spike D = Duplicate R = Rinsate PE = Perform Eval. — = Not a QC Sample

Shipment for Case Complete? (Y/N)	Page 3 of 5	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/17 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	

Distribution: Green - Region Copy; White - Lab Copy for Return to Region; Pink - CLASS Copy; Yellow - Lab Copy for Return to CLASS

EPA Form 9110-1 (8/99)

See Reverse for Additional Standard Instructions
*See Reverse for Purpose Code Definitions

395064

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. 30388 CT1254

1. Project Code	2. Account Code	3. Region No.	Sampling Co.	5. Date Shipped	Carrier
SI	2002T03V500 2DC2YL WD	3	Tetra Tech		Fedex

Regional Information:

Non-Superfund Program:

Sampler (Name): Tc Hire

Sampler Signature: [signature]

Airbill Number: See Page 1

6. Ship To: Liberty Analytical, 501 Madison Ave, Cary NC 27513
ATTN: Alice Evans

Site Name: VA1Z1002 0730

City, State: Dublin VA

Site Spill ID:

4. Purpose*
- Lead: SF, PRP, ST, FED
- Early Action: CLEM, PA, REM, RI, [X] SI, ESI
- Long-Term Action: FS, RD, RA, O&M, NPLD

7. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

8. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 7) Other:	B Conc.: Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 8) Other:	E — RAS Analysis: Dis. Metals	Total Metals	Cyanide	Low Only: NO_2NO_3	Fluoride	High Only: pH	Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform Eval., — = Not a QC Sample)
CT1254														4/16/02	CT1253		
-31	5	L	G	6		X						3062175 } Not Collected	SS-11	NA	-31	[initials]	
-32	5	L	G	6		X						-176 } Not Collected	SB-11A	NA	-32	[initials]	
-33	5	L	G	6		X						-177 } Not Collected	SB-11B	NA	-33	[initials]	
-34	5	L	G	6		X						-178	SS-12	1440	-34	[initials]	
-35	5	L	G	6		X						-179	SB-12A	1440	-35	[initials]	
-36	5	L	G	6		X						-180	SB-12B	1440	-36	[initials]	
-37	5	L	G	6		X						-181	SS-13	1515	-37	[initials]	D -40
-38	5	L	G	6		X						-182	SB-13A	1515	-38	[initials]	D -41
-39	5	L	G	6		X						-183	SB-13B	1515	-39	[initials]	D -42
-40	5	L	G	6		X						-184	SS-14	1515	-40	[initials]	D -37

Shipment for Case Complete? (Y/N): | Page 4 of 5 | Sample(s) to be Used for Laboratory QC: | Additional Sampler Signatures: | Chain of Custody Seal Number(s):

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/17 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	

Distribution: Green - Region Copy; White - Lab Copy for Return to Region; Pink - CLASS Copy; Yellow - Lab Copy for Return to CLASS

EPA Form 9110-1 (8/99)

See Reverse for Additional Standard Instructions
*See Reverse for Purpose Code Definitions

395065

EPA United States Environmental Protection Agency
Contract Laboratory Program

Inorganic Traffic Report & Chain of Custody Record
(For Inorganic CLP Analysis)

Case No. CT1254 30388

1. Project Code	2. Account Code	3. Region No.	Sampling Co.	5. Date Shipped	Carrier
SI	2002T03VS0102R03YL	3	Tachlaw		Fedex

Regional Information:

Sampler (Name): Fellinger

Non-Superfund Program

Sampler Signature:

Airbill Number: See Page 1

6. Ship To: Liberty Analytical, 501 Madison Ave, Cary NC 27513
ATTN: Alice Evans

Site Name: VAD2100@0730

City, State: [illegible] VA

Site Spill ID

4. Purpose*
Lead: SF, PRP, ST, FED
Early Action: CLEM, PA, REM, RI, [X] SI, ESI
Long-Term Action: FS, RD, RA, O&M, NPLD

7. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (specify in Column A)

8. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (specify in Column D)
N. Not Preserved

CLP Sample Numbers (from labels)	A Matrix (from Box 7) Other:	B Conc.: Low Med High	C Sample Type: Comp./Grab	D Preservative (from Box 8) Other:	E — RAS Analysis: Diss. Metals	Total Metals	Cyanide	Low Only: NO_2NO_3	Low Only: Fluoride	High Only: pH	High Only: Conduct.	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/Year/Time Sample Collection	I Corresponding CLP Organic Sample No.	J Sampler Initials	K Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Rinsate, PE = Perform Eval., — = Not a QC Sample)
CT1254														4/16/02	CT1253		
-41	5	L	G	6		X						3062185	SB-14A	1515	-41	~	D -38
-42	5	L	G	6		X						-186	SB-14B	1515	-42	~	D -39
-43	2	L	G	2,6		X						-187	FB	1600	-43	~	R

Shipment for Case Complete? (Y/N) Page 5 of 5

Sample(s) to be Used for Laboratory QC

Additional Sampler Signatures

Chain of Custody Seal Number(s)

Chain of Custody Record

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	4/17 / 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	

ORIGINAL (Red)

Distribution: Green - Region Copy; White - Lab Copy for Return to Region; Pink - CLASS Copy; Yellow - Lab Copy for Return to CLASS

EPA Form 9110-1 (8/99)

See Reverse for Additional Standard Instructions
*See Reverse for Purpose Code Definitions

395066

ROCS/Teclaw Teclaw

30388

ORIGINAL (Red)

U.S. EPA Region III Sample Scheduling Request Form

RAS CASE No: C[illegible] 30388	DAS No:		NSF No:
Date: 03/15/02	Data Validation Level: M3, IM2		EPA Lab Reply:
Site Name: USA Radford Ammunition Plt			Cost:
Address: State Rte 114	City: Radford City		State: VA
Latitude: 80.40.23	Longitude: 37.05.10		Anal +Val Data TAT:90 days
Program: Federal Facilities	CERCLIS No: VA1210020730		Activity: Site Inspection
Account No: 2002 T03N50102D038YLW00	Operable Unit:		Spill ID:
Preparer: John Fellinger	RPM/PO:James McKenzie		Site Leader: John Fellinger
Phone: 856 878-0988	Phone: 215 814 3338		Phone: 856 878-0988
FAX: 856 878-0618	FAX: 215 814 3051		FAX: 856 878-0618
E-mail: john.fellinger@verizon.net	E-mail: McKenzie.james@epa.gov		E-mail: john.fellinger@verizon.net
EPA CO: Jill Robbins	Contract Type: 68-W-00-108	Prime: TechLaw Inc.	Sub: NA
Lab Assignment Date:	Analytical TAT: ~~30 days~~ 21		Ship Date From: 18 Apr 2002
Organic Lab: SWOK			Ship Date To: 19 Apr 2002
Inorganic Lab: LIBRTY			Carrier:

SAMPLES	METHOD	PARAMETER	MATRIX
42	ILM04.2	TAL Metals → 19058	Soil
2	ILM04.2	TAL Metals Blank → 19058	Aqueous
42	OLM04.2	full organics olm04.2 → 19057	Soils
2	OLM04.2	full organics – blank → 19057	water

NOTE: Data validation levels M3 & IM2 require justification. QC field samples must be included as part of total number of samples.

1. Special Instructions:
2. Objectives / Project Plan ID / Permit ID: The QAPP for this project is the "Radford Army Ammunition Plant POP (January 1997)", Gannett Fleming, Inc. as ammended by the TechLaw, Inc. "Generic QAPP for Sample Collection and Analysis for ROC Sampling Activities, EPA Region 3, 2000" and the site-specific Work Plan for this event (in preparation). The objectives of the sampling event include the collection of soil samples. The data will be used for the evaluation of human health risk, ecological risk, and site characterization.
3. Program / Project / Permit Reporting Limits
4. DQO (QC Requirements) Precision and accuracy as per CLP SOWs.

Appendix D

Laboratory Case Narrative

U. S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ORIGINAL

Lab Name: COMPUCHEM Contract: 68W00082

Lab Code: LIBRTY Case No.: 30388 SAS No.: SDG No.: MC0QJ6

SOW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
MC0QJ6	MC0QJ6-1
MC0QJ6D	WG16949-2
MC0QJ6S	WG16949-1
MC0QJ7	MC0QJ6-2
MC0QJ8	MC0QJ6-3
MC0QJ9	MC0QJ6-4
MC0QK0	MC0QJ6-5
MC0QK1	MC0QJ6-6
MC0QK2	MC0QJ6-7
MC0QK3	MC0QJ6-8
MC0QK4	MC0QJ6-9
MC0QK5	MC0QJ6-10
MC0QK6	MC0QJ6-11
MC0QK7	MC0QJ6-12
MC0QK8	MC0QJ6-13
MC0QK9	MC0QJ6-14
MC0QL0	MC0QJ6-15
MC0QL1	MC0QJ6-16
MC0QL2	MC0QJ6-17
MC0QL3	MC0QJ6-18
MC0QL4	MC0QJ6-19

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: THE FOLLOWING ANALYTES HAVE BEEN FLAGGED WITH AN "E" TO INDICATE SERIAL DILUTION RESULTS WHICH ARE NOT WITHIN CONTROL LIMITS:
ZINC

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Thomas R. Cole Name: Thomas R. Cole

Date: April 25, 2002 Title: Data Reviewer II

3

U. S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ORIGINAL (Red)

Lab Name: COMPUCHEM Contract: 68W00082

Lab Code: LIBRTY Case No.: 30388 SAS No.: _____ SDG No.: MC0QJ6

SOW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
MC0QL5	MC0QJ6-20

Were ICP interelement corrections applied?	Yes/No	YES
Were ICP background corrections applied?	Yes/No	YES
If yes-were raw data generated before application of background corrections?	Yes/No	NO

Comments: THE FOLLOWING ANALYTES HAVE BEEN FLAGGED WITH AN "E" TO INDICATE SERIAL DILUTION RESULTS WHICH ARE NOT WITHIN CONTROL LIMITS:
ZINC

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4) Name: (b) (4)

Date: April 25, 2002 Title: Data Reviewer II

ORIGINAL (Red)

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

SDG NARRATIVE
CASE # 30388 SDG # MC0QJ6
CONTRACT # 68W00082

The indicated Sample Delivery Group (SDG) consisting of twenty (20) soil samples was received into the laboratory information management system (LIMS) on April 18, 2002; intact and in good condition with Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The samples were analyzed, in accordance with EPA - CLP Statement of Work (SOW) document ILM04.1 for CLP TAL total metals.

The correlation coefficient for the mercury analytical run is confirmed to be $\geq$ 0.9950.

The cooler temperature bottle was present with samples received on April 18, 2002; and sample temperature was 4.2 degrees Celsius.

Per Region 3, Case number is 30388 for CT1254. LIBRTY is to apply CLP sample numbers in the following fashion: MC0QJ6 for CT1254-01 and MC0QJ7 for CT1254-02 and so on.

EQUATIONS FOR SOLID SAMPLE CALCULATIONS:

Client sample MC0QJ6 is used for illustration.

Any sample result that is $\leq$ the instrument detection limit (IDL) will be entered at the IDL for that analyte.

ICP Equation:

Equation for obtaining metals sample results in mg/Kg as presented on FORM I data sheets from ICP instrument acquired results in ug/L (ppb).

$$\text{Concentration (\% solids) (mg/Kg)} = \frac{C \times D \times V}{W \times S}$$

Where
C = concentration (ug/L)
D = dilution factor
V = final volume in liters after sample preparation
W = weight in grams of wet sample
S = % solids/100

Example: aluminum result ug/L to mg/Kg.

$$\frac{73321.96 \text{ ug/L (C)} \times 1 \text{ (D)} \times 0.2 \text{ L (V)}}{1.0 \text{ g (W)} \times 0.610 \text{ (S)}} = 24039.99 \text{ mg/Kg reported as } 24000 \text{ mg/Kg}$$

Mercury Equation:

Equation for obtaining mercury sample results in mg/Kg as presented on FORM I data sheets from instrument acquired results in ug/L (ppb).

$$\frac{A \times D \times F}{B \times E}$$

Where

A = ug/L Hg
B = wet weight of sample
D = dilution factor to bring sample into analysis range
E = % solids/100
F = final volume in liters (0.1 L)

Example: mercury result ug/L to mg/Kg

$$\frac{0.1094 \text{ ug/L (A)} \times 1 \text{ (D)} \times 0.1 \text{ (F)}}{0.2 \text{ g (B)} \times 0.610 \text{ (E)}} = 0.0897 \text{ mg/Kg reported as } 0.090 \text{ mg/Kg}$$

SAMPLE IDs:

The following customer IDs are associated with this SDG:

MC0QJ6	MC0QJ7	MC0QJ8	MC0QJ9	MC0QK0	MC0QK1
MC0QK2	MC0QK3	MC0QK4	MC0QK5	MC0QK6	MC0QK7
MC0QK8	MC0QK9	MC0QL0	MC0QL1	MC0QL2	MC0QL3
MC0QL4	MC0QL5				

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within EPA CLP allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSS & PBS) were found to be within acceptable ranges and all field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike, CCN = WG16949-1 (MC0QJ6S) was found to be outside CLP control limits for antimony. The reported concentration for this analyte is flagged with an "N" on all associated Form 1 and on Form 5a.

An "N" indicates a matrix-related interference in the sample preparation procedure &/or analysis for the flagged analyte. This is normally the consequence of a relatively high anionic content in the sample or (for some sediments) an inconsistent sample matrix relative to that analyte.

CLP control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more. In this case, affected analytes are not flagged even if recoveries are outside percentage recovery control limits.

Post-digestion spikes are mandatory for analytes demonstrating unsatisfactory matrix spike recoveries during ICP analysis (excluding silver). The results of such spikes are presented on Form 5b.

Unsatisfactory recovery of post-digestion spikes of this type do not have bearing upon the aforementioned "N" flags, but may indicate interference during analysis &/or a solution matrix which is hostile to the analyte in question.

Satisfactory recovery of an analyte in a post-digestion spike of this type implies interference by the required preparation procedure or in the sample matrix itself. Lack of uniformity for an analyte in sediments will also result in satisfactory recovery of post-digestion spikes after failure in the related matrix spike.

The sample matrix duplicate, CCN = WG16949-2 (MC0QJ6D) was inside CLP control limits for the requested analytes.

CLP control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and +/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, CCN = MC0QJ6-1 (MC0QJ6L) was performed in accordance with CLP requirements for ICP analysis.

The adjusted sample concentrations were outside CLP control limits for zinc, which is flagged with an "E" on all associated Form 1, the Cover Page and Form 9.

An "E" indicates that a chemical or physical interference effect was encountered during the analysis of the flagged analyte. As a result of this interference, all values for the analyte in the same matrix must be considered to be estimated quantities.

CLP control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution-adjusted concentrations from the original values for all analyte concentrations with values greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

(b) (4) [redacted]

Data Reviewer II
April 25, 2002

U. S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ORIGINAL (Red)

Lab Name: COMPUCHEM Contract: 68W00082

Lab Code: LIBRTY Case No.: 30388 SAS No.: SDG No.: MC0QL6

SOW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
MC0QL6	MC0QL6-1
MC0QL6D	WG16950-2
MC0QL6S	WG16950-1
MC0QL7	MC0QL6-2
MC0QL8	MC0QL6-3
MC0QL9	MC0QL6-4
MC0QM0	MC0QL6-5
MC0QM1	MC0QL6-6
MC0QM2	MC0QL6-7
MC0QM3	MC0QL6-8
MC0QM4	MC0QL6-9
MC0QM5	MC0QL6-10
MC0QM6	MC0QL6-11
MC0QM7	MC0QL6-12
MC0QM8	MC0QL6-13
MC0QM9	MC0QL6-14
MC0QN0	MC0QL6-15
MC0QN1	MC0QL6-16
MC0QN2	MC0QL6-17
MC0QN3	MC0QL6-18
MC0QN4	MC0QL6-19

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: THE FOLLOWING ANALYTES HAVE BEEN FLAGGED WITH AN "E" TO INDICATE SERIAL DILUTION RESULTS WHICH ARE NOT WITHIN CONTROL LIMITS : MAGNESIUM and NICKEL.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4) Name: (b) (4)

Date: 4/25/02 Title: Senior Chemist 3

ORIGINAL (Red)

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

SDG NARRATIVE
CASE # 30388 SDG # MC0QL6
CONTRACT # 68W00082

The indicated Sample Delivery Group (SDG) consisting of nineteen (19) soil samples was received into the laboratory information management system (LIMS) on April 18, 2002 intact and in good condition with Chain of Custody (COC) Records in order, unless otherwise noted in any attachments or Quality Assurance Notices. The temperature of the samples upon receipt was 4°C, as determined from the cooler temperature indicator bottle.

The Case Number on the Traffic Report was listed as CT1254. The sample IDs listed on the Traffic Report are not CLP sample IDs. Region 3 responded that the correct Case Number was 30388 and SMO assigned new sample IDs.

The samples were analyzed, in accordance with EPA CLP Statement of Work (SOW) document ILM04.1, for the complete Inorganic Target Analyte List (TAL) metals.

The correlation coefficient for the mercury analytical run is confirmed to be ≥ 0.9950.

EQUATIONS FOR SOLID SAMPLE CALCULATIONS:

Equation for obtaining metals sample results in mg/kg as presented on FORM I data sheets from ICP instrument acquired results in µg/l (ppb).

$$\frac{C \times V}{W \times S}$$

Where

C = concentration (µg/l)

V = final volume in liters after sample preparation

W = weight in grams of wet sample

S = % solids/100

Example: aluminum result µg/l to mg/kg.

$$\frac{67120.99\ \mu g/l\ (C) \times 0.2\ l\ (V)}{1.0\ g\ (W) \times 0.734\ (S)} = 18289.098\ mg/kg\ \text{reported as } 18300 mg/kg$$

Equation for obtaining mercury sample results in mg/kg as presented on FORM I data sheets from instrument acquired results in µg/l (ppb).

$$\frac{C \times D \times V}{W \times S}$$

Where

C = concentration (µg/l)

W = wet weight of sample

D = dilution factor to bring sample into analysis range

S = % solids/100

V = final volume in liters

Example: mercury result µg/L to mg/kg

$$\frac{0.0456\ \mu g/l(C) \times 1\ (D) \times 0.11\ (V)}{0.2\ g\ (W) \times 0.734\ (S)} = 0.0311\ mg/kg \text{ reported as } 0.068\ mg/kg\ *$$

* This result reported down to the IDL.

SAMPLE IDs:
The following customer IDs are associated with this SDG:
MC0QL6 MC0QL7 MC0QL8 MC0QL9 MC0QM0 MC0QM1 MC0QM2 MC0QM3 MC0QM4 MC0QM5 MC0QM6 MC0QM7 MC0QM8 MC0QM9 MC0QN0 MC0QN1 MC0QN2 MC0QN3 MC0QN4

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within EPA CLP allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSS & PBS) were found to be within acceptable ranges and all field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike, CCN = WG16950-1 (MC0QL6S) was found to be outside CLP control limits for Antimony, Selenium and Thallium.

ORIGINAL (Red)

CLP control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more. In this case, affected analytes are not flagged even if recoveries are outside percentage recovery control limits.

The sample matrix duplicate, CCN = WG16950-2 (MC0QL6D) was found to be outside CLP control limits for Manganese.

CLP control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and +/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, CCN = SDIMC0QL6-1 (MC0QL6L) was performed in accordance with CLP requirements for ICP analysis.

The adjusted sample concentrations were outside CLP control limits for Magnesium and Nickel, which are flagged with an "E" on all associated Form I and Form IX.

CLP control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution adjusted concentrations from the original values for all analyte concentrations greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

An "E" flag indicates that a chemical or physical interference effect was encountered during the analysis of that analyte. As a result of the interference, all values for that analyte in the same matrix must be considered estimated values.

The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

(b) (4)

(b) (4)
Senior Chemist
April 25, 2002

U. S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ORIGINAL (Red)

Lab Name: COMPUCHEM Contract: 68W00082

Lab Code: LIBRTY Case No.: 30388 SAS No.: _____ SDG No.: MC0QN5

SOW No.: ILM04.1

EPA Sample No.	Lab Sample ID.
MC0QN5	MC0QN5-1

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4) Name: (b) (4)

Date: May 1, 2002 Title: Data Reviewer 3

ORIGINAL (Red)

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

SDG NARRATIVE
CASE # 30338 SDG # MC0QN5
CONTRACT # 68W00082

The indicated Sample Delivery Group (SDG) consisting of one (1) water sample was received into the laboratory information management system (LIMS) on April 18, 2002; intact and in good condition. Chains of Custody (COC) Records are in order, unless otherwise noted in any attachments or Quality Assurance Notices. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The sample was analyzed, in accordance with EPA - CLP Statement of Work (SOW) document ILM04.1 for CLP TAL total metals.

The correlation coefficient for the mercury analytical run is confirmed to be $\geq$ 0.9950.

The cooler temperature bottle was present with samples received on April 18, 2002; and sample temperature was 4.2 degrees Celsius.

Per Region 3, Case number is 30388 for CT1254. LIBRTY is to apply CLP sample numbers in the following fashion: MC0QJ6 for CT1254-01 and MC0QJ7 for CT1254-02 and so on.

Traffic Report # 395066 indicated sample ID- CT1254-43 (MC0QN5) with matrix of ground water was also a field blank. Per Region 3, LIBRTY should process the sample as a field blank. Please note the levels of aluminum, calcium, iron, magnesium, and manganese.

EQUATIONS FOR WATER SAMPLE CALCULATIONS:

Client sample MC0QN5 is used for illustration.

Any sample result that is $\leq$ the instrument detection limit (IDL) will be entered at the IDL for that analyte.

ICP Equation:

$$\text{ICP analyte, ug/L} = \frac{A \times D \times F}{B}$$

Where: A = ug/L (ppb) ICP analyte of sample from analysis
B = Liter of original sample for digestion (0.050 L)
D = any dilution factor necessary to bracket sample value within standard values
F = final sample solution volume (0.050 L)

Example: $\frac{31528.58 \text{ ppb(Ca)} \times 1 \times 0.050 \text{ L}}{0.050 \text{ L}}$ = 31528.58 ppb reported as 31500 ug/L of Ca

Mercury Equation:

$$\text{Hg, ug/L} = \frac{A \times D \times F}{B}$$

Where: A = ug/L (ppb) Hg of sample from analysis
B = Liter of original sample for digestion (0.10 L)
D = any dilution factor necessary to bracket sample value within standard values
F = final sample solution volume (0.10 L)

Example: $\frac{0.1193 \text{ ppb} \times 1 \times 0.10 \text{ L}}{0.10 \text{ L}} = 0.1193$ ppb reported as 0.12 ug/L of Hg

SAMPLE IDs:

The following customer IDs are associated with this SDG:

MC0QN5

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within EPA CLP allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and all field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

No matrix quality control samples were prepared and analyze in this case because the sample was a blank.

The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

(b) (4) [redacted]

(b) (4) [redacted]

Data Reviewer II
May 1, 2002

ORIGINAL (Red)

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
MC0QN5-1	MC0QN5	30388	MC0QN5	WA	EPA	68W00082-5A	4/18/02

ORIGINAL (Red)

Judy Snyder

05/06/02 04:53 PM

To: john.fellinger@verizon.net
cc:
Subject: 30388 USA Radford Ammunition Pit

The last SDG for the inorganic portion of this case just arrived. As with the other SDG's, you failed to use CLP sample numbers, the station locations on the tags do not match the station locations on the COC, there is no case number on the COC, only one air bill was listed on only one page of five pages of COCs, the matrix you listed for this single water sample, #2-ground water was incorrect. It should have been #4 - Field QC. You must write out all number prefixes except for tag numbers - if there is more than one tag number for a sample, it may be listed as 3-1234561 thru 565.
All dates and time must be written out on each line and must match the tags exactly for each sample.
You will please provide a memo to file to Client Services Team, the RPM, the Contracting Officer acknowledging and correcting these errors. I will fax you a copy of the new sample numbers as assigned by SMO/CLASS to be cross referenced with your CT numbers. Please do not hesitate to call if you need help.

Judy Snyder
ESAT Auditor, Region 3
Lockheed Martin Environmental Services
701 Mapes Road
Ft. Meade, MD 20755-5350
Phone 410-305-3015
Fax 410-305-3095

ORIGINAL (Red)

Melissa Stevens

From: (b) (4)
To: (b) (4)
epamail.epa.gov>; Dan Slizys (E-mail) <slizys.dan@epamail.epa.gov>; John Kwedar (E-mail) <kwedar.john@epamail.epa.gov>; Khin-Cho Thaung (E-mail) <thaung.khin-cho@epamail.epa.gov>
Sent: Friday, April 19, 2002 5:05 PM
Subject: Region 03 | Case 30388 | Lab LIBRTY | Issue TR/COC discrepancy - laboratory QC | FINAL

Melissa,

In accordance with previous direction from Region 3, the lab will select a sample for lab QC, as long as that sample is not a PE, blank, or rinsate sample. The lab will note the issue in the Case/SDG narrative and proceed with the analysis of the samples. SMO will record that the lab will use sample MC0CL6 for lab QC for this SDG.

If you have any other questions or problems, please let me know.

Thanks,
(b) (4)

(b) (4)
DynCorp Systems and Solutions LLC
CLP Coordinator for Regions 3 & 9
703-264-9526
holly.rogers@dyncorp.com <mailto:holly.rogers@dyncorp.com>

-----Original Message-----
From: (b) (4)
Sent: Friday, April 19, 2002 5:10 PM
To: (b) (4)
Subject: 30388

Hi (b) (4)
The sampler only designated one QC sample. I have two soil SDGs. MC0QJ6(QC) & MC0QL6(need QC). Could you ask the region if we can use MC0QL6 for QC.

Melissa Stevens
EPA Coordinator
(919) 379-4081
CompuChem a division of Liberty Analytical
www.compuchemlabs.com <http://www.compuchemlabs.com>

04/19/02

ORIGINAL (Red)

Melissa Stevens

From: [redacted]
To: [redacted]com>; [redacted]
Cc: Betty Ann Jeffery (E-mail) <jeffery.betty@epamail.epa.gov>; Dan Slizys (E-mail) <slizys.dan@epamail.epa.gov>; John Kwedar (E-mail) <kwedar.john@epamail.epa.gov>; Khin-Cho Thaung (E-mail) <thaung.khin-cho@epamail.epa.gov>
Sent: Friday, April 19, 2002 9:18 AM
Subject: Region 03 | Case 30388 | Lab LIBRTY | Issue TR/COC Discrepancy - project level | FINAL

Melissa,

Sorry about that. When I looked at the traffic report I thought they were organic. I'll make a note of the issue and will alert the Region.

Thanks,
[redacted]

[redacted]
DynCorp Systems and Solutions LLC
CLP Coordinator for Regions 3 & 9
703-264-9526
holly.rogers@dyncorp.com <mailto:holly.rogers@dyncorp.com>

-----Original Message-----
From: [redacted]
Sent: Thursday, April 18, 2002 7:30 PM
To: [redacted]
Subject: Re: Region 03 | Case 30388 | Lab LIBRTY | Issue TR/COC Discrepancy - project level | FINAL

[redacted]

These samples are inorganic not organic, so I just put a M in front of all of the IDs.

----- Original Message -----
From: [redacted]
To: [redacted]
Cc: Betty Ann Jeffery (E-mail) <jeffery.betty@epamail.epa.gov>; Dan Slizys (E-mail) <slizys.dan@epamail.epa.gov>; John Kwedar (E-mail) <kwedar.john@epamail.epa.gov>; Khin-Cho Thaung (E-mail) <thaung.khin-cho@epamail.epa.gov>
Sent: Thursday, April 18, 2002 4:24 PM
Subject: Region 03 | Case 30388 | Lab LIBRTY | Issue TR/COC Discrepancy - project level | FINAL

Alice,

Following is the resolution from Region 3 regarding this Case. Per the Region, the correct Case number is 30388. Also, SMO has assigned new inorganic sample IDs for this Case. The new IDs are C0QJ6 - C0QN8. The lab

6/25/2002
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ORIGINAL (Red)

should assign sample ID to C0QJ6 to sample CT1254-01, sample ID C0QJ7 to sample CT1254-02, sample ID C0QJ8 to sample CT1254-03, and so on. The lab should note the issue in the Case/SDG narrative and proceed with the analysis of the samples.

If you have any other questions or problems, please let me know.

Thanks,
(b) (4)

(b) (4)
DynCorp Systems and Solutions LLC
CLP Coordinator for Regions 3 & 9
703-264-9526
holly.rogers@dyncorp.com <mailto:holly.rogers@dyncorp.com>

-----Original Message-----
From: Thaung.Khin-Cho@epamail.epa.gov
[mailto:Thaung.Khin-Cho@epamail.epa.gov]
Sent: Thursday, April 18, 2002 3:04 PM
To: Rogers, Holly
Cc: Betty Ann Jeffery (E-mail); Dan Slizys (E-mail); John Kwedar (E-mail)
Subject: Re: NEW ISSUE | Case 30388 | Lab LIBRTY | Issue TR/COC Discrepancy - project level

(b) (4)

Yes, CT1254 is case number 30388. Please go ahead and assign the CLP sample IDs.

Khin

From: "(b) (4)
To: Betty Jeffery/ESC/R3/USEPA/US@EPA, Dan Slizys/ESC/R3/USEPA/US@EPA, John Kwedar/ESC/R3/USEPA/US@EPA, Khin-Cho Thaung/ESC/R3/USEPA/US@EPA
cc:
Subject: NEW ISSUE | Case 30388 | Lab LIBRTY | Issue TR/COC Discrepancy - project level
04/18/02 12:01 PM

Following is an email from LIBRTY regarding samples received for Case CT1254 (I believe the Case number should be 30388). The lab has attached a copy of the TRs for this Case. Also, the sampler did not use CLP sample IDs for the samples. The lab would like to verify the Case number and would like SMO to assign CLP sample IDs.

Please advise the lab how to proceed.

Thanks,
(b)

4.25.2002
222
~~222~~ 284

ORIGINAL (Red)

(b) (4)
DynCorp Systems and Solutions LLC
CLP Coordinator for Regions 3 & 9
703-264-9526
(b) (4)

-----Original Message-----
From: (b) (4)
Sent: Thursday, April 18, 2002 12:01 PM
To: (b) (4)
Subject: 30388??????

Hi Holly,
I attached the traffic reports, so you can take a look at them. I am going to need sample IDs as well as the case number. TTFN

(b) (4)
EPA Coordinator
(919) 379-4081
CompuChem a division of Liberty Analytical
www.compuchemlabs.com <http://www.compuchemlabs.com>
(See attached file: 30388.pdf)

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~~223~~
~~230~~